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**Lee et al.**

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(54) **REMOTELY CONTROLLABLE RECEPTACLE SYSTEM AND MANAGING METHOD FOR OPERATING THE SAME**

(71) Applicant: **Powertech Industrial Co., Ltd.**, Taipei Hsien (TW)

(72) Inventors: **Yu-Lung Lee**, Miaoli Couny (TW); **Jung-Hui Hsu**, Taipei County (TW); **Chun Chuan Chen**, Taipei County (TW)

(73) Assignee: **Powertech Industrial Co., Ltd.**, Taipei Hsien (TW)

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(30) **Foreign Application Priority Data**

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***G05B 11/01*** (2006.01)
***G08B 1/08*** (2006.01)

(52) **U.S. Cl.**
USPC ..... **340/12.22**; 340/539.32

(58) **Field of Classification Search**
USPC ..... 340/12.2, 12.5, 32, 539.21, 539.22; 455/11
See application file for complete search history.

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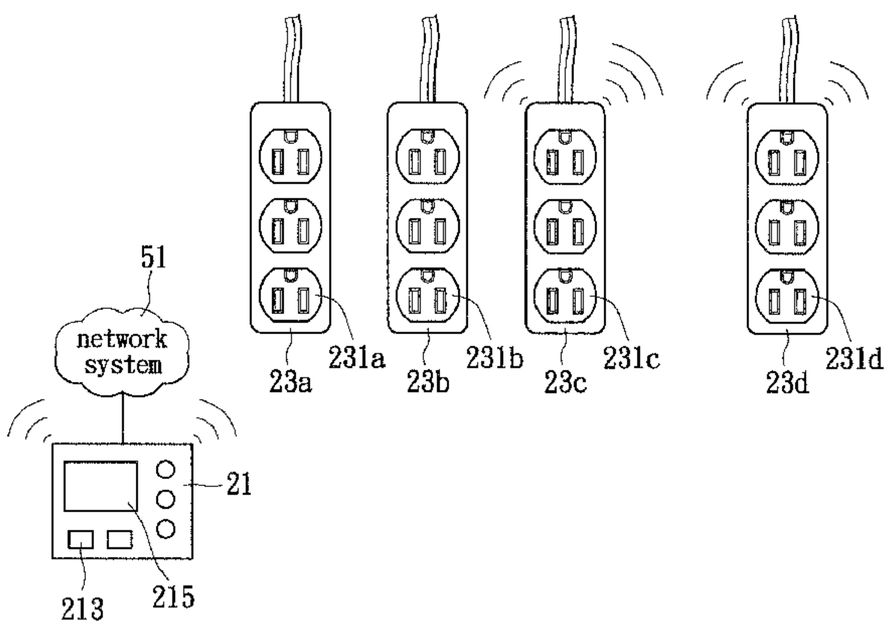
*Primary Examiner* — Tai T Nguyen
*Assistant Examiner* — Royit Yu
(74) *Attorney, Agent, or Firm* — Rosenberg, Klein & Lee

(57) **ABSTRACT**

A remotely controllable receptacle system is disclosed. The remotely controllable receptacle system includes a remote control device for emitting a first request signal and a searching signal, and a plurality of receptacle devices for emitting a first reply signal according to the first request signal. The remote control device determines whether the first reply signal is received and the receptacle device emitting the first reply signal is classified as the vicinity receptacle device and the receptacle device not emitting the first reply signal is classified as the missing receptacle device. The vicinity receptacle device is configured to emit a second request signal according to the searching signal and determine whether the missing receptacle device emits a second reply signal according to the second request signal before a mutual communication between the remote control device and the missing receptacle device via the vicinity receptacle device is established.

**4 Claims, 7 Drawing Sheets**



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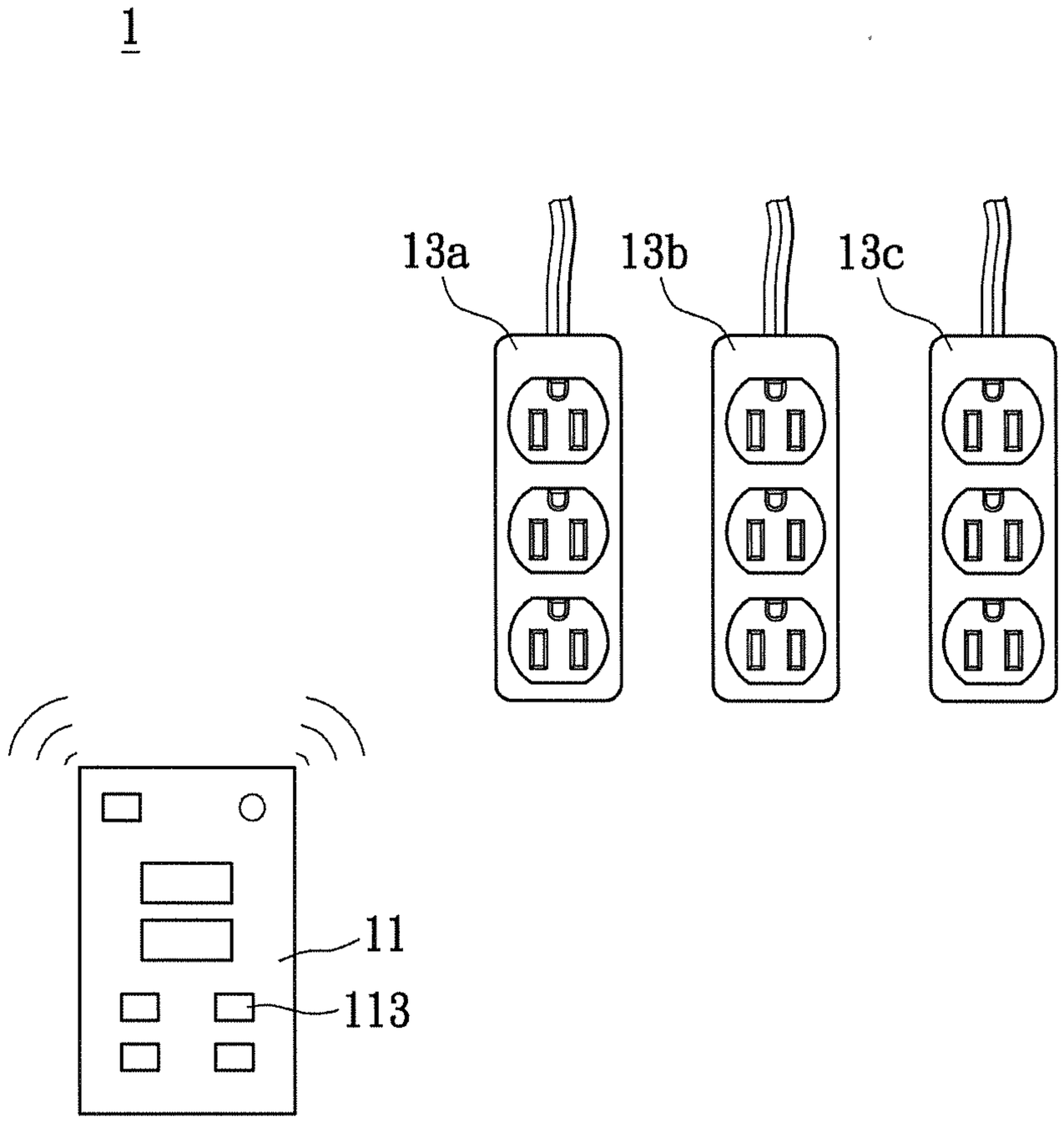


FIG. 1
PRIOR ART

2

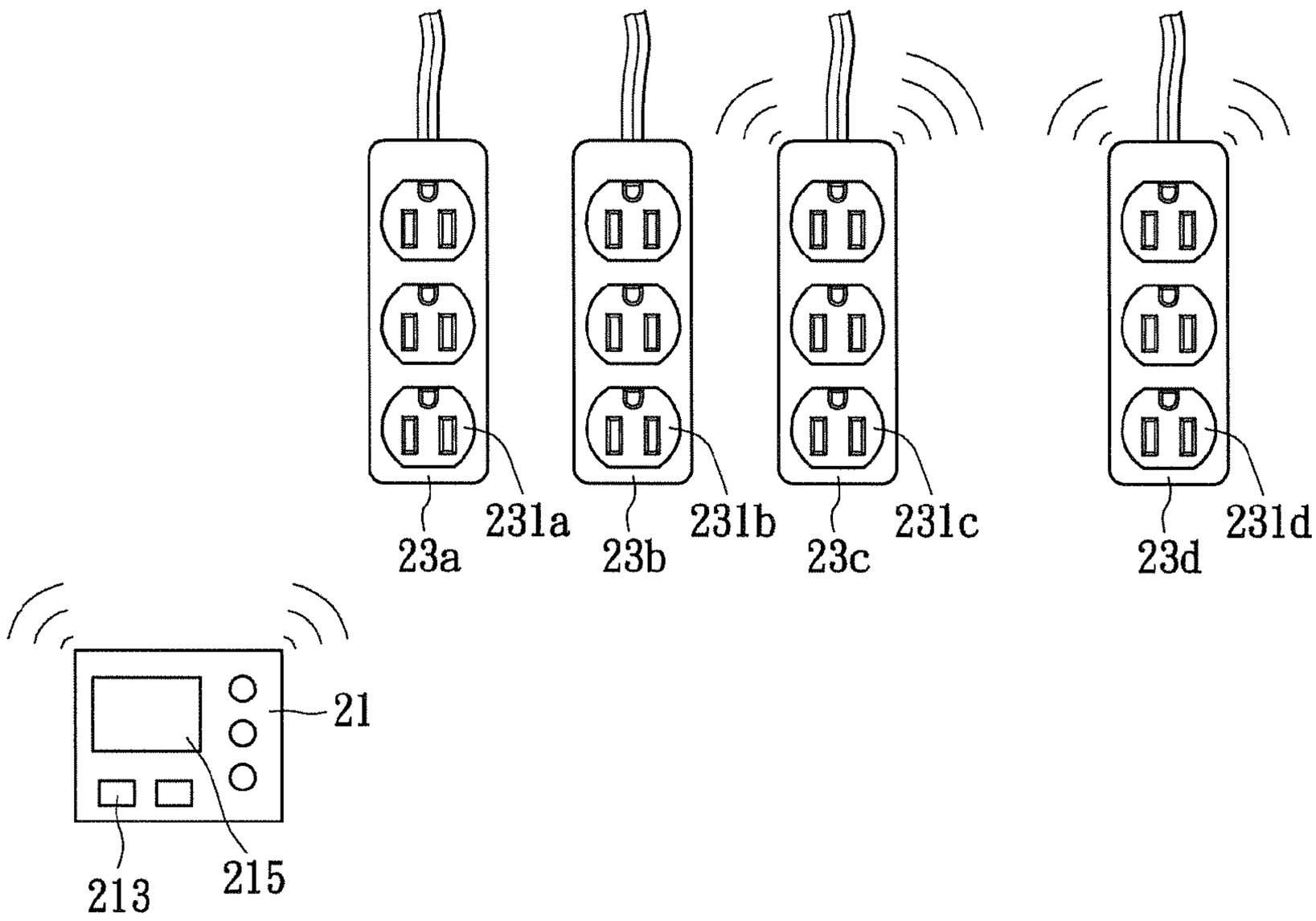


FIG. 2

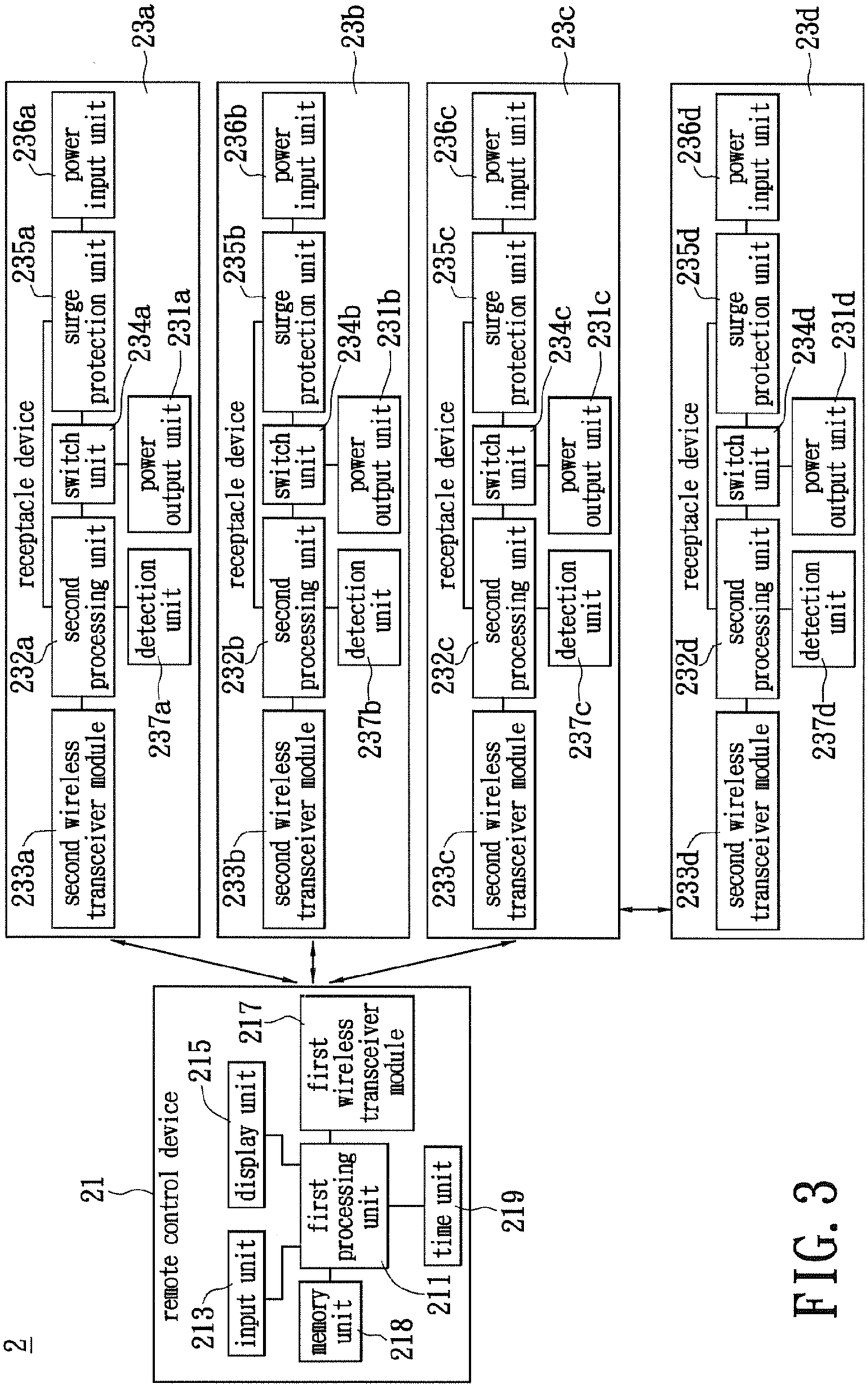
2
21
remote control device
213
input unit
215
display unit
217
first wireless transceiver module
211
first processing unit
218
memory unit
219
time unit
23a
receptacle device
232a
second processing unit
233a
second wireless transceiver module
235a
surge protection unit
236a
power input unit
234a
switch unit
231a
power output unit
237a
detection unit
23b
receptacle device
232b
second processing unit
233b
second wireless transceiver module
235b
surge protection unit
236b
power input unit
234b
switch unit
231b
power output unit
237b
detection unit
23c
receptacle device
232c
second processing unit
233c
second wireless transceiver module
235c
surge protection unit
236c
power input unit
234c
switch unit
231c
power output unit
237c
detection unit
23d
receptacle device
232d
second processing unit
233d
second wireless transceiver module
235d
surge protection unit
236d
power input unit
234d
switch unit
231d
power output unit
237d
detection unit

FIG. 3

3

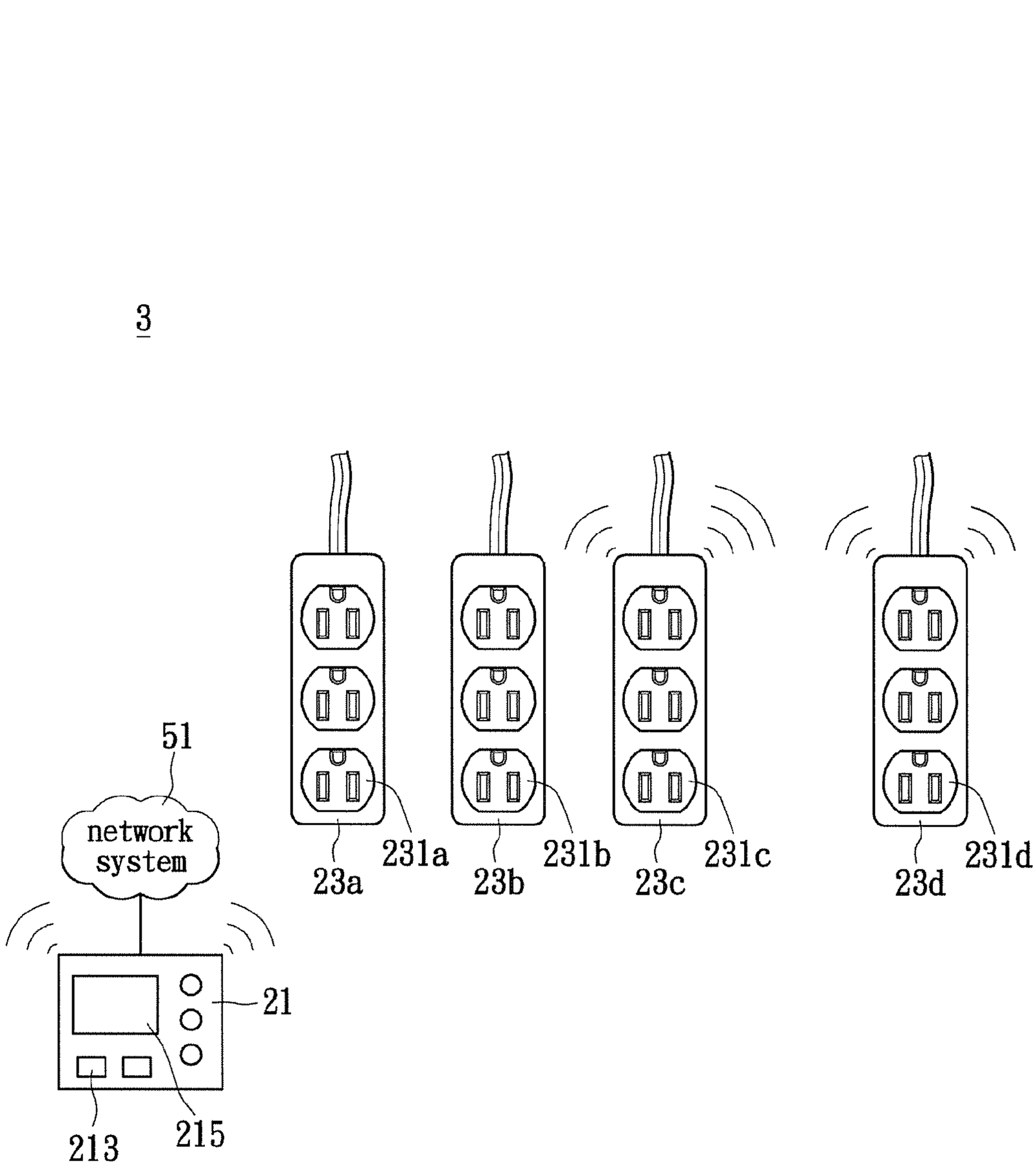
51
network system
21
213
215
23a
231a
23b
231b
23c
231c
23d
231d

FIG. 4

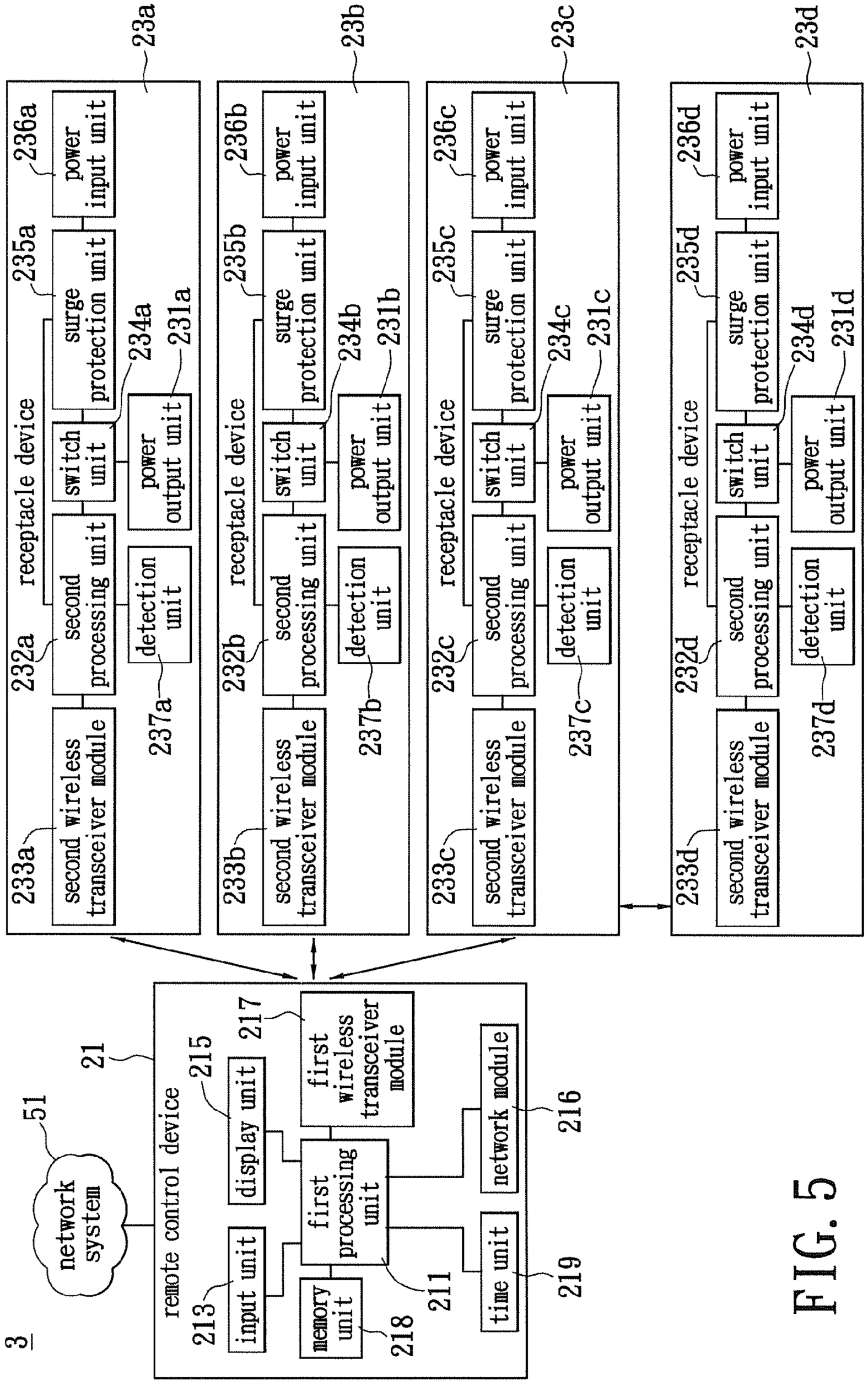
3
network system
51
21
remote control device
213
input unit
215
display unit
217
first wireless transceiver module
211
first processing unit
218
memory unit
219
time unit
216
network module
23a
receptacle device
232a
second processing unit
233a
second wireless transceiver module
235a
power input unit
236a
switch unit
234a
power output unit
231a
surge protection unit
237a
detection unit
23b
receptacle device
232b
second processing unit
233b
second wireless transceiver module
235b
power input unit
236b
switch unit
234b
power output unit
231b
surge protection unit
237b
detection unit
23c
receptacle device
232c
second processing unit
233c
second wireless transceiver module
235c
power input unit
236c
switch unit
234c
power output unit
231c
surge protection unit
237c
detection unit
23d
receptacle device
232d
second processing unit
233d
second wireless transceiver module
235d
power input unit
236d
switch unit
234d
power output unit
231d
surge protection unit
237d
detection unit

FIG. 5

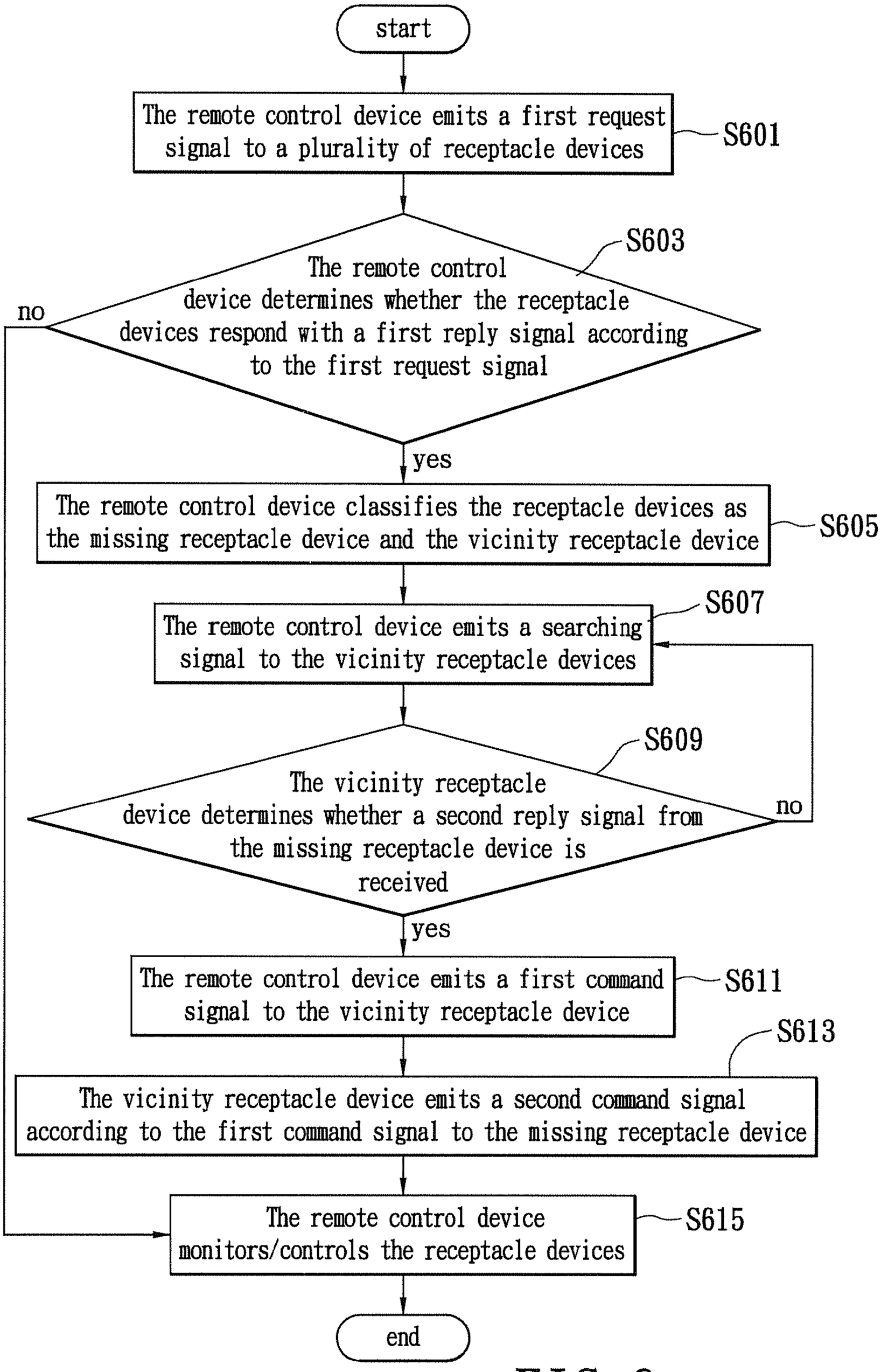
start
The remote control device emits a first request signal to a plurality of receptacle devices
S601
The remote control device determines whether the receptacle devices respond with a first reply signal according to the first request signal
S603
no
yes
The remote control device classifies the receptacle devices as the missing receptacle device and the vicinity receptacle device
S605
The remote control device emits a searching signal to the vicinity receptacle devices
S607
The vicinity receptacle device determines whether a second reply signal from the missing receptacle device is received
S609
no
yes
The remote control device emits a first command signal to the vicinity receptacle device
S611
The vicinity receptacle device emits a second command signal according to the first command signal to the missing receptacle device
S613
The remote control device monitors/controls the receptacle devices
S615
end

FIG. 6

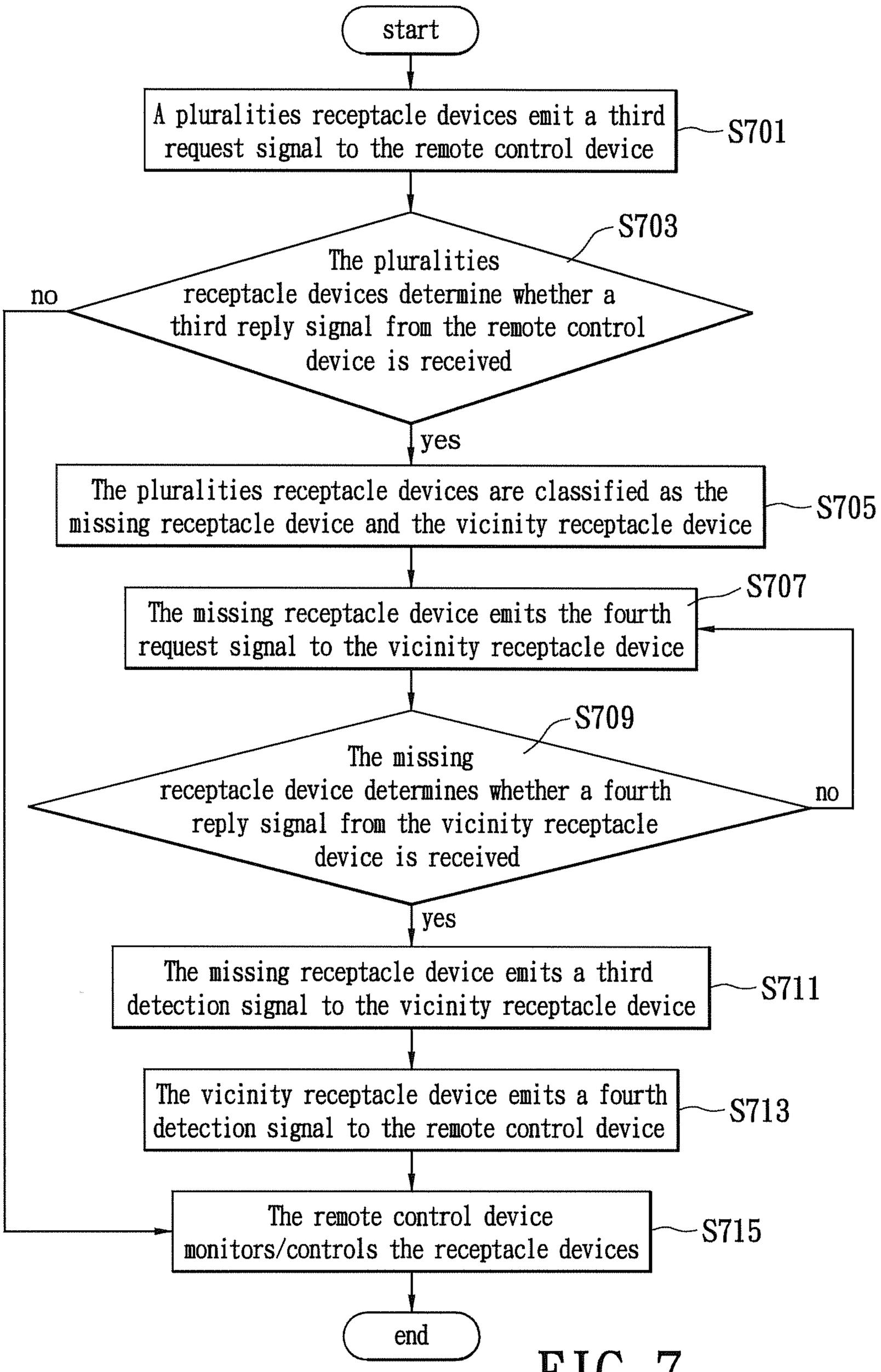
start
A pluralities receptacle devices emit a third request signal to the remote control device
S701
S703
The pluralities receptacle devices determine whether a third reply signal from the remote control device is received
no
yes
The pluralities receptacle devices are classified as the missing receptacle device and the vicinity receptacle device
S705
S707
The missing receptacle device emits the fourth request signal to the vicinity receptacle device
S709
The missing receptacle device determines whether a fourth reply signal from the vicinity receptacle device is received
no
yes
The missing receptacle device emits a third detection signal to the vicinity receptacle device
S711
The vicinity receptacle device emits a fourth detection signal to the remote control device
S713
The remote control device monitors/controls the receptacle devices
S715
end

FIG. 7

# REMOTELY CONTROLLABLE RECEPTACLE SYSTEM AND MANAGING METHOD FOR OPERATING THE SAME

## RELATED APPLICATIONS

This application is a Continuation patent application of application Ser. No. 12/828,491, filed on 1 Jul. 2010, now U.S. Pat. No. 8,427,283. The entire disclosure of the prior application Ser. No. 12/828,491, from which an oath or declaration is supplied, is considered a part of the disclosure of the accompanying Divisional application and is hereby incorporated by reference.

## BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a remotely controllable receptacle system and the managing method for operating the same. In particular, the present invention relates to remotely controllable receptacle system that is capable of remotely controlling the receptacle device via complementary transmission between the receptacle devices within the receptacle system.

2. Description of Related Art

A conventional remotely controllable receptacle system is shown in FIG. **1**. The remotely controllable receptacle system **1** includes a remote control device **11** and a plurality of receptacle devices **13***a*, **13***b*, and **13***c*. The receptacle devices **13***a*, **13***b*, and **13***c* could be in-wall or a power strip receptacle devices connecting with a power source for supplying power to varied electronic equipments, and the remote control device **11** controls whether to connect the receptacle devices **13***a*, **13***b*, and **13***c* to the power source.

The conventional remotely controllable receptacle system **1** enables a mutual communication between the remote control device **11** and the receptacle devices **13***a*, **13***b* and **13***c* via wireless transmission. However, the remote control device **11** merely control the receptacle device **13***a* located within the transmission range of the wireless transmission. In other words, the distance between the remote control device **11** and the receptacle devices **13***a*, **13***b*, and **13***c* may limit the application of the conventional remotely controllable receptacle system **1**. Plus, interferences such as obstacles and electromagnetic interferences may further undermine the usage of the conventional remotely controllable receptacle system.

More specifically, when any one of the receptacle devices **13***a*, **13***b* and **13***c* is not within the transmission range, the remote control device **11** may not control the operations of that particular receptacle device while also lacking any knowledge of whether any receptacle device is under control.

## SUMMARY OF THE INVENTION

One objective of the present invention is to functionally extend the effective transmission range of the remote control device.

The remotely controllable receptacle system includes a remote control device comprising a first wireless transceiver module for emitting a first request signal and a searching signal, and a plurality of receptacle devices for emitting a first reply signal according to the first request signal wherein each receptacle device comprises a second wireless transceiver module. The remote control device determines whether the first reply signal is received and the receptacle device emitting the first reply signal is classified as the vicinity receptacle device and the receptacle device not emitting the first reply signal is classified as the missing receptacle device.



The vicinity receptacle device is configured to emit a second request signal according to the searching signal and determine whether the missing receptacle device emits a second reply signal according to the second request signal before a mutual communication between the remote control device and the missing receptacle device via the vicinity receptacle device is established.

In order to further understand the techniques, means and effects the present invention takes for achieving the prescribed objectives, the following detailed descriptions and appended drawings are hereby referred, such that, through which, the purposes, features and aspects of the present invention can be thoroughly and concretely appreciated; however, the appended drawings are merely provided for reference and illustration, without any intention to be used for limiting the present invention.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a schematic diagram of a conventional remotely controllable receptacle system,

FIG. **2** is a schematic diagram of a remotely controllable receptacle system in accordance with one embodiment of the present invention,

FIG. **3** is a functional block diagram of the remotely controllable receptacle system in accordance with one embodiment of the present invention,

FIG. **4** is a schematic diagram of the remotely controllable receptacle system in accordance with one embodiment of the present invention,

FIG. **5** is a functional block diagram of the remotely controllable receptacle system in accordance with one embodiment of the present invention,

FIG. **6** is a flowchart illustrating a managing method of the remotely controllable receptacle system in accordance with one embodiment of the present invention; and

FIG. **7** is a flowchart illustrating a managing method of the remotely controllable receptacle system in accordance with one embodiment of the present invention.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. **2** is a schematic diagram of a remotely controllable receptacle system in accordance with one embodiment of the present invention.

Throughout the disclosure, the remotely controllable receptacle system **2** includes a remote control device **21** and a plurality of receptacle devices **23***a*, **23***b*, **23***c* and **23***d*. The remote control device **21** configures an input unit **213** and a display unit **215** wherein the input unit **213** could be a button, a knob or a touch panel, and the display unit **215** could be a digital or needle display unit. In one implementation, the digital display unit **215** is a liquid crystal display panel. The pluralities of receptacle devices **23***a*, **23***b*, **23***c* and **23***d* have power output units **231***a*, **231***b*, **231***c* and **231***d*, respectively. In one implementation, the plurality of power output units **231***a*, **231***b*, **231***c* and **231***d* are plug sockets.

The remote control device **21** could transmit and receive a signal and the remote control device **21** could monitor and control the pluralities of receptacle devices **23***a*, **23***b*, **23***c* and **23***d* located within a transmission range of the remote control device **21**. Thus, the remote control device **21** may control the operations of the receptacle devices **23***a*, **23***b*, **23***c* and **23***d* so that the latter may deliver (or not to deliver) the required

power to the electronic devices connected to the receptacle devices **23***a*, **23***b*, **23***c*, and **23***d*. The remote control device **21** may monitor the power consumption detected by the pluralities of receptacle devices **23***a*, **23***b*, **23***c* and **23***d*. The pluralities of receptacle devices **23***a*, **23***b*, **23***c* and **23***d* further detect the real time overload, the voltage spike and the ambient temperature and report the detection result to the remote control device **21** immediately.

The pluralities of receptacle devices **23***a*, **23***b*, **23***c* and **23***d* are able to communicate with each other. In on implementation, the pluralities of receptacle devices **23***a*, **23***b*, **23***c* and **23***d* emit a detection signal when they detect an abnormality and/or variation in the real time overload, the voltage spike, and/or the ambient temperature in order to minimize the power consumption of the mutual communication between the remote control device **21** and the pluralities of receptacle devices **23***a*, **23***b*, **23***c* and **23***d*.

The remote control device **21** controls the operations of the receptacle devices **23***a*, **23***b*, **23***c* and **23***d* by analyzing the signals from the latter. The remote control device **21** may also calculate the power consumption or carbon footprint and display the same on the display unit **215**.

In one implementation, the remote control device **21** may be move around so that the transmission range of the remote control device **21** may change, causing one or more receptacle devices **23***a*, **23***b*, **23***c* and **23***d* to be outside the transmission range. When the receptacle device is outside the transmission range of the remote control device **21**, that particular receptacle device (e.g., the receptacle device **23***d*) may be considered as the missing receptacle device and other receptacle devices (e.g., **23***a*, **23***b*, and **23***c*) are considered as vicinity receptacle devices.

The remote control device **21** may communicate with the missing receptacle device **23***d* via one of the vicinity receptacle device **23***a*, **23***b* and **23***c*. For example, the vicinity receptacle **23***c* may duplicate the signal from the missing receptacle device **23***d* and relay the same to the remote control device **21**.

FIG. **3** is a functional block diagram of the remotely controllable receptacle system in accordance with one embodiment of the present invention.

The remote control device **21** has a first processing unit **211**, the input unit **213**, the display unit **215**, a first wireless transceiver module **217**, a memory unit **218** and a time unit **219**. The pluralities of receptacle devices **23***a*, **23***b*, **23***c* and **23***d* have power output units **231***a*, **231***b*, **231***c* and **231***d*, second processing units **232***a*, **232***b*, **232***c* and **232***d*, second wireless transceiver modules **233***a*, **233***b*, **233***c* and **233***d*, switch units **234***a*, **234***b*, **234***c* and **234***d*, surge protection units **235***a*, **235***b*, **235***c* and **235***d*, power input units **236***a*, **236***b*, **236***c* and **236***d*, and detection units **237***a*, **237***b*, **237***c* and **237***d*, respectively.

The first wireless transceiver module **217** may be controlled by the first processing unit **211** before outputting a first wireless signal or receives a second wireless signal from second wireless transceiver modules **233***a*, **233***b*, **233***c* and **233***d*. The first wireless transceiver module **217** communicates with the second wireless transceiver modules **233***a*, **233***b*, **233***c* and **233***d* via Bluetooth, Ultra Wide Band or RFID technique.

The memory **218** could be a flash memory unit for storing a setup information and signal information. The setup information may include electricity fees, power consumption or carbon footprint. The signal information is associated with the power consumption corresponding to the pluralities of receptacle device **23***a*, **23***b*, **23***c* and **23***d* that is detected and transmitted by the second wireless signal. Additionally, the time unit **219** is configured to generate a time signal.

The power input units **236***a*, **236***b*, **236***c* and **236***d* is connected with commercial power via an electric wire (not shown) and a plug (not shown) for delivering a power supply. The surge protection units **235***a*, **235***b*, **235***c* and **235***d* may avoid the surge from damaging the electrical equipment connected with the pluralities of receptacle devices **23***a*, **23***b*, **23***c* and **23***d*. The switch units **234***a*, **234***b*, **234***c* and **234***d* are configured to control the power output units **231***a*, **231***b*, **231***c* and **231***d* according to the operation of the second processing units **232***a*, **232***b*, **232***c* and **232***d*. The detection units **237***a*, **237***b*, **237***c* and **237***d* are configured to detect the overload, the voltage spike, and ambient temperature according to the operation of the second processing units **232***a*, **232***b*, **232***c* and **232***d*.

The second processing units **232***a*, **232***b*, **232***c* and **232***d* are configured to control detection modes of the detection units **237***a*, **237***b*, **237***c* and **237***d* or control the operations of the switch units **234***a*, **234***b*, **234***c* and **234***d* according to the first wireless signal received by the second wireless transceiver modules **233***a*, **233***b*, **233***c* and **233***d*. The second wireless transceiver modules **233***a*, **233***b*, **233***c* and **233***d*, which are controlled by the second processing units **232***a*, **232***b*, **232***c* and **232***d*, are configured to further transmit the detection signal from the detection units **237***a*, **237***b*, **237***c* and **237***d*.

The remote control device **21** may emit a first request signal to the pluralities of receptacle devices **23***a*, **23***b*, **23***c* and **23***d* in a predetermined sequence. In one implementation, the remote control device **21** may emit the first request signal to the receptacle devices **23***a*, **23***b*, **23***c*, and **23***d* in turn. The receptacle devices **23***a*, **23***b*, **23***c* and **23***d* may emit a first reply signal according to the first request signal. The remote control device **21** determines whether the first wireless transceiver **217** receives the first reply signal. If one of the receptacle devices **23***a*, **23***b*, **23***c* and **23***d* does not respond to the first request signal with emitting the first reply signal, that particular receptacle device may be considered as the missing receptacle device. Other receptacle devices that respond to the first request signal with emitting the first reply signal may be classified as the vicinity receptacles. Above classification for the missing receptacle device and the vicinity receptacle device is temporarily stored in the memory unit **218**.

If the receptacle device **23***d* does not respond to the first reply signal, the remote control device **21** may emit a searching signal to the vicinity receptacle devices **23***a*, **23***b* and **23***c* in turn. The vicinity receptacle devices **23***a*, **23***b* and **23***c* may search for the missing receptacle device **23***d* according to the searching signal. The process of searching for the missing receptacle device **23***d* includes causing the vicinity receptacle devices **23***a*, **23***b*, and **23***c* to emit a second request signal according to the searching signal. If the missing receptacle device **23***d* is located within the effective transmission range of one of the vicinity receptacle devices **23***a*, **23***b* and **23***d*, the missing receptacle device **23***d* may emit a second reply signal according to the second request signal. Thereafter, when the vicinity receptacle device **23***c* receives the second reply signal, which is indicative of locating the missing receptacle device **23***d* has been accomplished, the remote control device **21** may stop emitting the searching signal for the missing receptacle device **23***d*. Thus, the remote control device **21** may communicate with the missing receptacle **23***d* via the vicinity receptacle device **23***c*.

When the detection unit **237***d* of the missing receptacle device **23***d* detects an abnormality or variation in the real time overload, the voltage spike, and/or the ambient temperature,

the missing receptacle device **23***d* may emit a first detection signal. The vicinity receptacle device **23***c* may duplicate and modulate the first detection signal into a second detection signal upon a receipt of the first detection signal, and delivers the second detection signal to the remote control device **21**. The first processing unit **211** may compare the second detection signal with the setup signal stored in the memory unit **217** before generating a first judging signal.

The remote control device **21** may further emit a first command signal according to an operating command received from the input unit **213** or the first judging signal from the first processing unit **211**. The vicinity receptacle device **23***c* may duplicate and modulate the first command signal into a second command signal and delivers the second command signal to the missing receptacle device **23***d*. The second processing unit **232***d* may control the switch unit **234***d* by turning on/off the switch unit **234***d* or setting a timer for the switch unit **234***d* according to the second command signal. Thereby, the remote control device **21** could control the missing receptacle device **23***d* via the vicinity receptacle **23***c*.

On the other hand, if the remote control device **21** does not determine whether any receptacle device is the missing receptacle device proactively, the pluralities of receptacle device **23***a*, **23***b*, **23***c* and **23***d* may communicate with the remote control device **21** by communicating with each other. More specifically, the pluralities of receptacle devices **23***a*, **23***b*, **23***c* and **23***d* may emit a third request signal to the remote control device **21** and determine whether any receptacle device is not located in the effective transmission range of the remote control device **21** on basis of whether any receipt of a third reply signal from the remote control device **21**.

If the receptacle device **23***d* does not receive the third reply signal, the receptacle device **23***d* may be classified as the missing receptacle device, while the receptacle devices **23***a*, **23***b* and **23***c* that do receive the third reply signal from the remote control device **21** may be classified as the vicinity receptacle devices.

The missing receptacle device **23***d* may then search for the vicinity receptacle devices **23***a*, **23***b* and **23***c* by emitting a fourth request signal, and communicates with the remote control device **21** via one of the vicinity receptacle devices **23***a*, **23***b* and **23***c* when one of those vicinity receptacle devices **23***a*, **23***b*, and **23***c* responds a fourth reply signal according to the fourth request signal. If the vicinity receptacle **23***c*.

The missing receptacle device **23***d* may emit a third detection signal after detecting an abnormality and/or variation in the real time overload, the voltage spike, and/or the ambient temperature. The vicinity receptacle device **23***c* relative to the missing receptacle device **23***d* may duplicate and modulate the third detection signal into a fourth detection signal and transfers the fourth detection signal to the remote control signal **21**. The first processing unit **211** may emit a second judging signal by comparing the fourth detection signal with the setup signal stored in the memory **218**.

The remote control device **21** may emit a third command signal according to the operating command received by the input unit **213** or the second judging signal from the first processing unit **211**. The vicinity receptacle device **21***c* may duplicate and/or modulate the third command signal into a fourth command signal and transfers the fourth command signal to the missing receptacle device **23***d* in order to cause the missing receptacle device **23***d* to turn on/off the switch unit **234***d*. Thereby, the remote control device **21** may control the missing receptacle device **23***d*.

FIG. **4** is a schematic diagram of the remotely controllable receptacle system in accordance with one embodiment of the present invention.

The remotely controllable receptacle system **3** in FIG. **4** is similar to the remotely controllable receptacle system **2** in FIG. **2** while the remote control device **21** of the remotely controllable receptacle system **3** further includes a network system **51**. The network system **51** is a telephone system, a global position system, a personal computer or personal digital assistant. The remote control device **21** downloads and updates the setup information via the network system **51**. The pluralities of the receptacle devices **23***a*, **23***b*, **23***c* and **23***d* may be monitored and remotely controlled via the network system **51**.

FIG. **5** is a functional block diagram of the remotely controllable receptacle system in accordance with one embodiment of the present invention.

The remote control system **3** in FIG. **5** is similar to the remote control system **2** in FIG. **3** while the remote control device **21** of the remote control system **3** further includes a network module **216** connected with the first processing unit **211**. The remote control device **21** is connected with the network system **51** via the network module **216**. In one implementation, the network module **216** is an Ethernet card.

In conjunction with FIG. **3**, FIG. **6** is a flowchart illustrating a managing method of the remotely controllable receptacle system in accordance with one embodiment of the present invention.

The remote control device **21** emits the first request signal to the pluralities of receptacle devices **23***a*, **23***b*, **23***c* and **23***d* (S**601**). The remote control device **21** determines whether the pluralities of receptacle devices **23***a*, **23***b*, **23***c* and **23***d* respond with the first reply signal (S**603**). If all receptacle devices **23***a*, **23***b*, **23***c* and **23***d* respond with the first reply signal to determine whether the receptacle devices are classified as the missing receptacle device. When all receptacle devices **23***a*, **23***b*, **23***c*, and **23***d* respond to the first request signal with the first reply signal, they could be monitored and remotely controlled by the remote control device **21** (S**615**).

If one of the pluralities receptacle devices **23***a*, **23***b*, **23***c* and **23***d* (such as the receptacle device **23***d*) does not respond with the first reply signal, the remote control device **21** classifies the receptacle device **23***d* as the missing receptacle device and the receptacle devices **23***a*, **23***b* and **23***c* as the vicinity receptacle devices (S**605**). The remote control device **21** emits the searching signal to the vicinity receptacle devices **23***a*, **23***b*, and **23***c* in turn (S**607**). The vicinity receptacle devices **23***a*, **23***b* and **23***c* emit the second request signal to the missing receptacle device **23***d* and determine whether the missing receptacle device **23***d* responds to the second request signal with the second reply signal by determining whether the second reply signal is received (S**609**). If one of the receptacle devices **23***a*, **23***b* and **23***c* (such as the receptacle device **23***c*) receives the second reply signal, which is indicative of that the receptacle device **23***d* is located, the remote control device **21** stops emitting the searching signal. If all receptacle devices **23***a*, **23***b* and **23***c* do not receive the second reply signal, the remote control device **21** may cause the remotely controllable receptacle systems **2** and **3** to be reset by issuing a warning to operators.

After the remote control device **21** establishing the communication with the missing receptacle device **23***d*, the remote control device **21** emits the first command signal to the vicinity receptacle device **23***c* (S**611**). The vicinity receptacle device **23***c* duplicates and modulates the first command signal into the second command signal and delivers the second command signal to the missing receptacle device **23***d* (S**613**).

The remote control device **21** also controls the operations of the vicinity receptacle devices **23***a*, **23***b* and **23***c*.

In conjunction with FIG. **3**, FIG. **7** is a flowchart illustrating a managing method of the remotely controllable receptacle system in accordance with one embodiment of the present invention.

When the remote control device **21** does not proactively determine whether any receptacle device is classified as the missing receptacle device. The receptacle device **23***a*, **23***b*, **23***c* and **23***d* may communicate with the remote control device **21** by mutually communicating with each other. The receptacle devices **23***a*, **23***b*, **23***c* and **23***d* emit the third request signal to the remote control device **21** (S**701**). The receptacle devices **23***a*, **23***b*, **23***c* and **23***d* determine whether the third reply signal from the remote control device **21** is received (S**703**) (i.e., the receptacle devices **23***a*, **23***b*, **23***c*, and **23***d* are within the effective transmission range of the remote control device **21**). If all receptacle devices **23***a*, **23***b*, **23***c* and **23***d* receive the third reply signal, the remote control device **21** may in turn monitor and remotely control the receptacle devices **23***a*, **23***b*, **23***c* and **23***d* (S**715**).

If one receptacle device (such as the receptacle device **23***d*) does not receive the third reply signal, the receptacle devices **23***a*, **23***b*, and **23***c* may be classified as the vicinity receptacle device while the receptacle device **23***d* is classified as the missing receptacle device (S**705**). The receptacle device **23***d* emits the fourth request signal to the vicinity receptacle devices **23***a*, **23***b* and **23***c* to search which vicinity receptacle device may be capable of communicating with the missing receptacle device **23***d* (S**707**). The missing receptacle device **23***d* determines whether the fourth reply signal from the vicinity receptacle devices **23***a*, **23***b* and **23***c* is received (S**709**). If one of the vicinity receptacle devices **23***a*, **23***b* and **23***c* (such as the vicinity receptacle device **23***c*) emits the fourth reply signal that is received by the missing receptacle device **23***d*, the missing receptacle device **23***d* stops emitting the fourth request signal. Thereby, the missing receptacle device **23***d* may communicate with the vicinity receptacle device **23***c* and the remote control device **21**.

The missing receptacle device **23***d* emits the third detection signal to the vicinity receptacle device **23***c* (S**711**). The vicinity receptacle device **23***c* duplicates and modulates the third detection signal into the fourth detection signal and delivers the fourth detection signal to the remote control device **21** (S**713**). The remote control device **21** monitors and remotely controls the missing receptacle device **23***d* according to the fourth detection signal.

To sum up, the present invention utilizes mutually communication between the receptacle devices to extend the effective transmission range of the remote control device.

What are disclosed above are only the specification and the drawings of the preferred embodiment of the present invention and it is therefore not intended that the present invention be limited to the particular embodiment disclosed. It will be understood by those skilled in the art that various equivalent changes may be made depending on the specification and the drawings of the present invention without departing from the scope of the present invention.

What is claimed is:

**1**. A managing method adapted for a remotely controllable receptacle system having a remote control device and a plurality of receptacle devices, the managing method comprising:

emitting a third request signal to the remote control device by the plurality of the receptacle devices;

determining whether a third reply signal from the remote control device is received by the plurality of receptacle devices;

classifying the receptacle device receiving the third reply signal as a vicinity receptacle device and the receptacle device not receiving the third reply signal as a missing receptacle device;

searching for the vicinity receptacle device by the missing receptacle; and

establishing a mutual communication with the remote control device by the missing receptacle device via the vicinity receptacle device.

**2**. The method as claimed in claim **1**, wherein searching for the vicinity receptacle device further comprises;

emitting a fourth request signal to the vicinity receptacle device by the missing receptacle device; and

determining whether a fourth reply signal from the vicinity receptacle device is received by the missing receptacle device.

**3**. The method as claimed in claim **2**, wherein establishing the mutual communication with the remote control device further comprises communicating with the remote control device via the vicinity receptacle device emitting the fourth reply signal.

**4**. The method as claimed in claim **3**, further comprising:

emitting a third detection signal to the vicinity receptacle device by the missing receptacle device; and

emitting a fourth detection signal according to the third detection signal to the remote control device by the vicinity receptacle device searched by the missing receptacle device.

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